02/07/2025

Code-B Phase-2

Aakash
Medical | IIT-JEE | Foundations

Corporate Office : AESL, 3rd Floor, Incuspaze Campus-2, Plot No. 13, Sector-18,
Udyog Vihar, Gurugram, Haryana - 122015, *Ph.*+91-1244168300

MM : 720 Fortnightly Test for NEET-2026_RM(P2)_FT-01B **Time : 180 Min.**

Topics Covered:
Physics: Units & Measurements, Motion in a Straight Line
Chemistry: Some Basic Concepts of Chemistry
Botany: Cell : The Unit of Life
Zoology: Structural Organisation in Animals-Animal Tissues, Biomolecules-I: (Upto polysaccharides)

General Instructions :
Duration of Test is 3 hrs.
The Test consists of 180 questions. The maximum marks are 720.
There are four parts in the question paper consisting of Physics, Chemistry, Botany and Zoology having 45 questions in each part of equal weightage.
Each question carries +4 marks. For every wrong response, –1 mark shall be deducted from the total score. Unanswered/Unattempted questions will be given no marks.
Use blue/black ballpoint pen only to darken the appropriate circle.
Mark should be dark and completely fill the circle.
Dark only one circle for each entry.
Dark the circle in the space provided only.
Rough work must not be done on the Answer sheet and do not use white fluid or any other rubbing material on the Answer sheet.

Vivek Krishna

PHYSICS

1. A parrot is flying due east at a speed of 5 m/s. A train 300 m long is also travelling due east at a speed of 15 m/s. Both parrot and train are moving in same straight line and train is 100 m behind the parrot at $t = 0$. Then how long will train take to overtake the parrot completely?

   (1) $\frac{1}{60}$ hour

   (2) $\frac{1}{90}$ hour

   (3) $\frac{1}{50}$ hour

   (4) $\frac{1}{40}$ hour

2. **Assertion :** The length of actual path travelled by the body in a given time interval is called distance.
   Reason : A vector drawn from initial position to final position of a body is called displacement vector.

   (1) Both Assertion and Reason are true and Reason is the correct explanation of Assertion

   (2) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion

   (3) Assertion is true but Reason is false

   (4) Both Assertion and Reason are false

3. Round off the value 4.345 to three significant figures.

   (1) 4.33

   (2) 4.30

   (3) 4.34

   (4) 4.35

4. Taking into account of the significant figures, what is the value of 8.73 m – 0.0073 m?

   (1) 8.7 m

   (2) 8.72 m

   (3) 8.722 m

   (4) 8.7227 m

5. A ball is dropped from a height of 10 m, which after making repeated bounces finally comes to halt in 5 seconds, its average velocity is

   (1) Zero

   (2) 1 m/s

   (3) 2 m/s

   (4) 3 m/s

6. A ball is thrown vertically upward so as to reach maximum height of 40 m. The time interval for which the ball will remain above 20 m is [given, $g = 10\ m\ s^{-2}$]

(1) 2 s

(2) 3 s

(3) 6 s

(4) 4 s

7. Side of a square is 1.05 m. The area of square upto correct significant figures will be

(1) $1.1025\ m^2$

(2) $1.10\ m^2$

(3) $1.1\ m^2$

(4) $1.102\ m^2$

8. The relation between t and x for a particle moving in a straight line is given by $t = bx^3 + 2ax^2$.
Identify the correct expression relating the acceleration 'β' of the particle to its velocity 'v' and to 'x'.

(1) $\beta = -v^3(6bx + 4a)$

(2) $\beta = -2av^3$

(3) $\beta = -2bv^3$

(4) $\beta = v^3(6bx + 4a)$

9. If velocity of a body is given by $v = \alpha t^{3/2}$, then dimension of α should be (t is time)

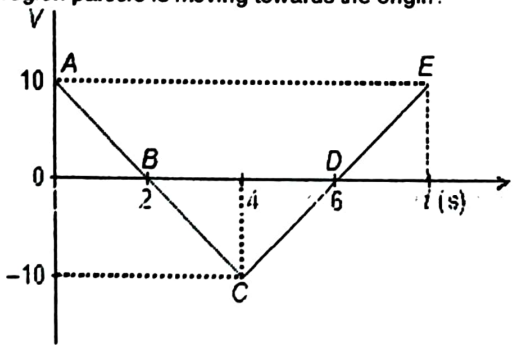
(1) $[LT^{5/2}]$

(2) $[L^{-1}T^{5/2}]$

(3) $[LT^{-5/2}]$

(4) $[LT^{-3/2}]$

10. Velocity-time graph of a particle moving in a straight line is as shown in the figure. At $t = 0$, $x = +10$ m. In which region particle is moving towards the origin?



(1) AB and BC

(2) BC and DE

(3) BC and CD

(4) CD and DE

11. The physical quantity, which has dimensions of reciprocal of time is

(1) Work

(2) Force

(3) Surface tension

(4) Angular speed

12. The number of significant zeroes present in the measured value 0.00210040, is

(1) Five

(2) Six

(3) Three

(4) Two

13. A metallic wire has a mass (0.6 ± 0.003) g, radius (0.5 ± 0.005) mm and length (4 ± 0.04) cm. The maximum percentage error in the measurement of its density will be

(1) 4%

(2) 3.5%

(3) 3%

(4) 2.5%

14. Match the column I with column II.

	Column I		Column II
A	Work	P	$ML^{-1}T^{-2}$
B	Strain	Q	$M^0L^0T^0$
C	Stress	R	ML^2T^{-3}
D	Power	S	ML^2T^{-2}

(1) A → P, B → Q, C → R, D → S

(2) A → S, B → Q, C → P, D → R

(3) A → P, B → S, C → Q, D → R

(4) A → R, B → S, C → P, D → Q

15. A balloon carrying a stone is moving upward with a constant speed 10 m/s. When balloon is at height 75 m, the stone is dropped. The time taken by the stone to reach the ground after release is ($g = 10\ m/s^2$)

(1) 4 s

(2) $\sqrt{15}$ s

(3) 5 s

(4) 6 s

16. In new system, force, velocity and density are considered as new fundamental quantities. The dimensional formula of power in new system will be

(1) $[F^1V^2D^{-1}]$

(2) $[FV^{-1}D]$

(3) $[F^2V^{-1}D^2]$

(4) $[F^1V^1D^0]$

Vivek Krishna

17. In an experiment, four physical quantities a, b, c and d are measured with percentage error 1%, 2%, 3% and 4% respectively. Physical quantity P is calculated as: $P = \frac{a^3 b^2}{\sqrt{c}\, d^2}$. Maximum percentage error in P is

(1) 7%

(2) 8%

(3) 9%

(4) 11%

18. Find $\frac{d}{dx}\left(x^2 \sin x\right)$.

(1) $2x\sin x + x\cos x$

(2) $2x\cos x + x\sin x$

(3) $x^2\cos x + 2x\cos x$

(4) $2x\sin x + x^2\cos x$

19. **A statement of assertion (A) is followed by a statement of reason (R).**
A : A unitless quantity may have dimension.
R : Angle has no unit but has same dimension as that of length.

(1) Both Assertion & Reason are true and the reason is the correct explanation of the assertion.

(2) Both Assertion & Reason are true but the reason is not the correct explanation of the assertion.

(3) Assertion is true statement but Reason is false.

(4) Both Assertion and Reason are false statements.

20. A particle moving along x–axis whose instantaneous speed is given by $v^2 + \frac{1}{2}x^2 = 225$. The acceleration of the particle at x = 4m is

(1) $-1 m/s^2$

(2) $-2 m/s^2$

(3) $4 m/s^2$

(4) $-9 m/s^2$

21. A : Light year is the unit of distance.
R : Parsec is the unit of time

(1) If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1).

(2) If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2).

(3) If Assertion is true statement but Reason is false, then mark (3).

(4) If both Assertion and Reason are false statements, then mark (4).

22. A body is thrown vertically upward, such that the distance travelled by it in fifth and sixth seconds are equal. The maximum height reached by the body is

(1) 30 m

(2) 60 m

(3) 125 m

(4) 120 m

23. A rocket is fired from the earth surface with constant vertical acceleration. A bolt is dropped from the rocket 2.0 s after the firing and fuel of the rocket is finished in 7.0 s after the bolt is dropped. Time of free fall of the bolt to the ground is 4.8 s. Acceleration of the free fall is 10 m/s^2. Which of the following statement is/are correct?

(1) Ascending acceleration of the rocket with fuel is nearly 10.0 m/s^2

(2) Maximum height attained by the bolt from the ground is nearly 40 m

(3) Maximum speed of the rocket is nearly 70 m/s

(4) Both (1) and (2)

24. If v is speed, r is radius and g is acceleration due to gravity, which of the following is dimensionless?

(1) $\frac{v^2 r}{g}$

(2) $\frac{v^2 g}{r}$

(3) $\frac{v^2}{rg}$

(4) $v^2 rg$

Vivek Krishna

25. A rod of length 2.00 m (true length) is measured by four students as 1.96 m, 1.98 m, 2.15 m and 2.05 m respectively. The most accurate measurement among the following is

(1) 1.96 m

(2) 1.98 m

(3) 2.15 m

(4) 2.05 m

26. Consider the following statements and choose the correct option.
(a) Path length is a scalar quantity whereas displacement is a vector quantity.
(b) The magnitude of displacement is always equal to the path length traversed by an object over a given time interval.
(c) The displacement depends only on the initial and final positions whereas path length depend on the actual path followed.
(d) The path length is always positive whereas displacement can be positive, negative or zero.

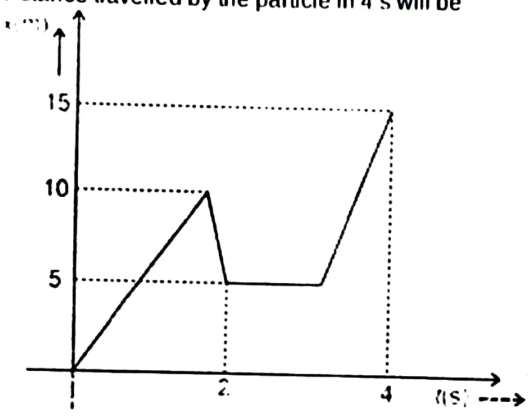
(1) All statements a, b, c and d are correct

(2) Only a and b are correct

(3) Only a, c and d are correct

(4) Only a, b and c are correct

27. The variation of position of a particle moving along a straight line is as shown in the figure given below. The distance travelled by the particle in 4 s will be



(1) 15 m

(2) 25 m

(3) 10 m

(4) 5 m

28. Density of liquid in CGS system is 0.5 g cm^{-3}. What is its numerical value in SI system?

(1) 50

(2) 500

(3) 5×10^{-3}

(4) 5×10^{-4}

29. In a Vernier calipers, if n divisions of Vernier scale coincide with $(n-2)$ divisions of the main scale, the least count of the caliper is (Take 1 MSD = 1 cm)

(1) $\frac{(n-1)}{n}$ cm

(2) $\frac{2}{n}$ cm

(3) $\frac{(n-2)}{n}$ cm

(4) $\frac{n}{2}$ cm

30. The position-time graph of two cars A and B are straight lines making angles 37° and 53° with time axis respectively. The ratio of magnitude of velocities of A and B is

(1) 1 : 1

(2) 4 : 3

(3) 9 : 16

(4) 3 : 2

31. If mass (M), force (F) and velocity (V) are taken as fundamental quantities, then the dimensional formula of time is

(1) $[M^{-1} F^{-1} V]$

(2) [M F V]

(3) $[M^{-1} F V^{-1}]$

(4) $[M F^{-1} V]$

32. The velocity of a particle moving along y-axis is given by $\sqrt{v^2 - 2y} = 2$. The time after which the particle starts retracing its own path is

(1) 1 s

(2) 2 s

(3) $\frac{1}{2}$ s

(4) $\frac{1}{4}$ s

33. Find $\int_R^\infty \frac{GMm}{x^2} . dx$

(1) $\frac{GMm}{x^3}$

(2) $\frac{GMm}{R}$

(3) $\frac{GMm}{xR}$

(4) ∞

34. From the top of a building of height 100 m, a ball is dropped. At the same time another ball is projected vertically upwards from ground with a velocity 50 m/s along the same line. The height from ground where the two balls will meet each other is (Take g = 10 m/s^2 and neglect air resistance)

(1) 40 m

(2) 50 m

(3) 80 m

(4) 90 m

Vivek Krishna

35. A car moving with a velocity of 36 kmph along a straight line is slowed down to 18 kmph in 5 s. The retardation of the car is

(1) 1 m/s^2

(2) 2 m/s^2

(3) 4 m/s^2

(4) 3 m/s^2

36. A car moving with speed of 15 m s^{-1} can be stopped by applying brakes after travelling a distance 2 m. If the same car is moving with a speed of 7.5 m s^{-1}, the minimum stopping distance is

(1) 1 m

(2) 2 m

(3) 0.5 m

(4) 2.5 m

37. The displacement of a particle which is undergoing uniformly accelerated motion in 4^{th} and 5^{th} second is 10 m and 14 m respectively. Find out the displacement of particle in 6^{th} second.

(1) 16 m

(2) 17 m

(3) 18 m

(4) 19 m

38. The diameter of a spherical body, when measured with vernier callipers yielded the following values: 4.33 cm, 4.32 cm, 4.38 cm, 4.31 cm and 4.32 cm. The mean diameter to appropriate significant figures is

(1) 4.3 cm

(2) 4.33 cm

(3) 4.332 cm

(4) 4.4 cm

39. A screw gauge has pitch of 0.1 cm. Its circular scale has 100 divisions. What is its least count?

(1) 0.1 mm

(2) 0.01 mm

(3) 0.02 mm

(4) 0.001 mm

40. A body starts to fall freely under gravity. The distance covered by it, in first, second, second-second and third-second are in ratio

(1) 1 : 4 : 9

(2) 1 : 2 : 3

(3) 1 : 3 : 5

(4) 1 : 11 : 14

41. Consider the following statements
Statement A : For a particle moving along a straight line, if velocity and acceleration are in opposite direction then particle is slowing down.
Statement B : For a particle moving along a straight line, if velocity is zero at an instant, then acceleration must be zero at that instant.
Based upon above informations, choose the correct option.

(1) Both statement (A) and statement (B) are correct

(2) Both statement (A) and statement (B) are incorrect

(3) Statement (A) is correct and statement (B) is incorrect

(4) Statement (A) is incorrect and statement (B) is correct

42. A ball is thrown vertically upward with a speed of 20 m s^{-1} from the edge of a tower. It hits near the base of the tower with speed 40 m s^{-1}. The maximum height of the ball above the ground is

(1) 40 m

(2) 60 m

(3) 80 m

(4) 120 m

43. If F represents force and t is time, then in equation $F = pt^{-2} + qt$, the sum of power in dimension of mass in p and q is

(1) 1

(2) 2

(3) 3

(4) 4

44. p represents momentum and q represents position, then the dimensions of Planck's constant (h) in terms of p and q are

(1) pq^2

(2) p^2q

(3) pq

(4) p^2q^3

Vivek Krishna

45. Time taken by a vertically projected body to reach maximum height from ground is 10 s. Velocity of the body at half of the maximum height is (Take g = 10 m/s^2 and neglect air resistance)

(1) 50 m/s

(2) 25 m/s

(3) $25\sqrt{2}$ m/s

(4) $50\sqrt{2}$ m/s

CHEMISTRY

46. If haemoglobin contains 0.334% iron by mass and one molecule of haemoglobin has 4 atoms of iron then the molecular mass of haemoglobin is approximately

(1) 98432.4 u

(2) 54298.6 u

(3) 24502.5 u

(4) 67065.8 u

47. An example of homogeneous mixture is

(1) Copper

(2) Oil and water

(3) Air

(4) Carbon dioxide

48. If 30% (mass/mass) aqueous solution of KI has density 1.02 g/mL then molarity of the solution will be (Atomic mass of K = 39 u and I = 127 u)

(1) 2.8 M

(2) 1.4 M

(3) 2.5 M

(4) 1.8 M

49. If 4 g of NaOH is dissolved in 36 g of H_2O, then the mole fractions of NaOH and H_2O in the solution respectively are

(1) $\frac{2}{21}, \frac{19}{21}$

(2) $\frac{1}{20}, \frac{19}{20}$

(3) $\frac{2}{20}, \frac{18}{20}$

(4) $\frac{1}{21}, \frac{20}{21}$

50. Which of the following is a compound?

(1) C

(2) H_2

(3) NH_3

(4) S_8

51. An organic compound contains carbon, hydrogen and oxygen. Its elemental analysis gave C, 38.71% and H, 9.67%. The empirical formula of the compound would be

(1) CH_3O

(2) CH_4O

(3) CHO

(4) CH_2O

52. The density of 1 M aqueous solution of NaOH is 1.2 g/cm^3. The molality of the solution will be [Given that, molar mass of NaOH = 40 g mol^{-1}].

(1) 0.76 m

(2) 0.70 m

(3) 0.86 m

(4) 0.94 m

53. Suppose the elements X and Y combine to form two compounds XY_2 and X_3Y_2. If 0.2 mole of XY_2 weighs 20 g and 0.1 mole of X_3Y_2 weighs 18 g, then the atomic mass in u of X and Y respectively will be

(1) 40, 30

(2) 60, 40

(3) 20, 30

(4) 30, 20

54. Number of molecules of oxygen present in 56 L of air at STP is (Given: Air contains 20% oxygen by volume)

(1) 1.2×10^{24}

(2) 4.2×10^{25}

(3) 6.02×10^{24}

(4) 3.01×10^{23}

55. Following are the two statements labelled as Assertion (A) and Reason (R)

Assertion (A) : Molarity of a solution depends upon temperature.

Reason (R) : Volume of a solution is temperature dependent quantity.

In the light of above statements, choose the correct option.

(1) Both (A) and (R) are correct and (R) is the correct explanation of (A)

(2) Both (A) and (R) are correct but (R) is not correct explanation of (A)

(3) (A) is correct and (R) is incorrect

(4) Both (A) and (R) are incorrect

56. 6.02×10^{21} molecules of urea are present in 100 mL of its solution. The concentration of solution is

(1) 0.01 M

(2) 0.001 M

(3) 0.1 M

(4) 0.02 M

57. Which of the following is not a mixture?

(1) Brass

(2) Milk

(3) Mud

(4) Water

Vivek Krishna

58. The number of significant figures in 0.0034 is

(1) 2

(2) 3

(3) 4

(4) 5

59. What mass of 90% pure $CaCO_3$ will be required to neutralise 40 mL of 0.5 M HCl solution according to the following reaction?

$CaCO_3(s) + 2HCl(aq) \rightarrow CaCl_2(aq) + CO_2(g) + H_2O(l)$

(1) 2.28 g

(2) 4.56 g

(3) 3.22 g

(4) 1.11 g

60. The number of moles of hydrogen molecules required to produce 30 moles of ammonia through Haber's process is

(1) 45

(2) 15

(3) 30

(4) 20

61. How many grams of concentrated nitric acid solution should be required to prepare 900 mL of 4.0 M HNO_3 solution? (Given, the concentrated HNO_3 solution is 70% $(\frac{w}{w})$ HNO_3)

(1) 324 g

(2) 264 g

(3) 445 g

(4) 405 g

62. 14.0 g of N_2 has same number of molecules as in

(1) 32 g of O_2

(2) 2 g of H_2

(3) 32 g of CH_4

(4) 22 g of CO_2

63. Which of the following has the highest number of oxygen atoms at STP?

(1) 4.48 L carbon dioxide gas

(2) 5.4 g of water vapour

(3) 5.6 g of carbon monoxide gas

(4) 0.1 mol of sulphur dioxide gas

64. What quantity of 50% pure $MgCO_3$ will give 10 g MgO on heating?

(1) 20 g

(2) 40 g

(3) 42 g

(4) 45 g

65. The total number of electrons in 1.6 g of CH_4 to that in 1.8 g of H_2O

(1) Double

(2) Same

(3) Triple

(4) One fourth

66. The mass percentage of oxygen in H_2SO_4 is

(1) 15.23

(2) 65.31

(3) 17.15

(4) 23.24

67. Match the given columns and choose the option containing most appropriate match:

Column I Quantity		Column II Total number of atoms
a. 2.24 mL of O_2 gas at STP	(i)	4.21×10^{24}
b. 1.4g of N_2 gas	(ii)	3.011×10^{21}
c. 6.022×10^{20} molecules of methane gas	(iii)	6.022×10^{22}
d. 1 mol of H_2SO_4	(iv)	1.204×10^{20}

(1) a–(iv), b–(iii), c–(ii), d–(i)

(2) a–(iv), b–(i), c–(ii), d–(iii)

(3) a–(ii), b–(iii), c–(iv), d–(i)

(4) a–(iv), b–(iii), c–(i), d–(ii)

68. From 220 mg of CO_2, 10^{21} molecules of CO_2 are removed. Number of remaining molecules of CO_2 will be

(1) 3.011×10^{21}

(2) 2.011×10^{21}

(3) 1.011×10^{21}

(4) 6.022×10^{21}

69. One mole of CO_2 gas is passed over heated coke. The percentage increase in the mass of gas is

(1) 12%

(2) 18.35%

(3) 27.27%

(4) 100%

70. Match List-I with List-II

List-I Amount of substance		List-II Number of atoms
a. 64 g of CH_4	(i)	$4\ N_A$
b. 8 g of H_2	(ii)	$2\ N_A$
c. 11.2 L of SO_3 at STP	(iii)	$8\ N_A$
d. 44.8 L of N_2 at STP	(iv)	$20\ N_A$

The correct match is

(1) a(iv), b(iii), c(ii), d(i)

(2) a(iii), b(iv), c(ii), d(i)

(3) a(ii), b(iv), c(i), d(iii)

(4) a(iv), b(iii), c(i), d(ii)

71. If the molar ratio of NH_3 and CO_2 gases in a mixture is 2 : 1, then the mass ratio of these two gases in the mixture is

(1) 2 : 1

(2) 17 : 4

(3) 11 : 17

(4) 17 : 22

Vivek Krishna

72. If vapour density of a gas is 23 then chemical formula of possible gas is

(1) CH_4

(2) NH_3

(3) NO_2

(4) CO

73. Mass percent of glucose in an aqueous solution is 18%. The molality of glucose solution is

(1) 1.22 m

(2) 1.86 m

(3) 2.21 m

(4) 0.75 m

74. If the molality of NaOH in an aqueous solution is 8 m then $(\frac{w}{w})$ % of NaOH in the solution will be

(1) 32.4%

(2) 24.2%

(3) 15.8%

(4) 36.2%

75. Given below are two statements.
Statements I: Atomic masses of elements in calculations are actually average atomic masses of its isotopes.
Statements II: Different isotopes of an element have equal abundance in nature.
In the light of the above statements, choose the correct answer from the options given below:

(1) Both Statement I and Statement II are correct

(2) Both Statement I and Statement II are incorrect

(3) Statement I is correct but Statement II is incorrect

(4) Statement I is incorrect but Statement II is correct

76. Consider the process,
$2C + O_2 \rightarrow 2CO$
$Fe_2O_3 + 3CO \rightarrow 2Fe + 3CO_2$
The volume of O_2 required at STP which can produce sufficient CO to reduce 1 g Fe_2O_3 (Molar mass of Fe_2O_3 = 160 gm/mol) is

(1) 210 ml

(2) 180 ml

(3) 240 ml

(4) 160 ml

77. If the mole fraction of ethanol in water is 0.02 then its molality in the aqueous solution will be

(1) 1.13 m

(2) 0.26 m

(3) 2.45 m

(4) 1.81 m

78. Which of the following molecules has highest percentage of oxygen by mass?

(1) H_2O

(2) CO_2

(3) $CaCO_3$

(4) C_2H_5OH

79. What is mass of sodium acetate (CH_3COONa) required to make 200 ml of 0.245 molar aqueous solution? (Molar mass of CH_3COONa = 82 g mol^{-1})

(1) 3 g

(2) 4 g

(3) 5 g

(4) 6 g

80. A solution is prepared by adding 2 mol of glucose to 8 mol of water. The mole fraction of glucose will be

(1) 0.2

(2) 0.8

(3) 0.7

(4) 0.4

81. One mole of carbon-12 atoms weigh 12 g. Mass of one carbon-12 atom is

(1) 1.99×10^{-22} g

(2) 1.99×10^{-21} g

(3) 1.99×10^{-23} g

(4) 1.99×10^{-24} g

82. An element X has the following isotopic composition, ^{100}X : 90%, ^{99}X : 8.0%, ^{102}X : 2.0%. The average atomic mass of the naturally occurring element X is closest to

(1) 99 amu

(2) 100 amu

(3) 101 amu

(4) 101.5 amu

83. Volume of O_2 required at STP to react completely with 180 g of ethane is

(1) 470.4 L

(2) 448 L

(3) 134.4 L

(4) 224 L

84. 1.0 g of magnesium is burnt with 0.56 g O_2 in a closed vessel. Which reactant is left in excess and how much? (At. wt. Mg = 24; O = 16)

(1) Mg, 0.16 g

(2) O_2, 0.16 g

(3) Mg, 0.44 g

(4) O_2, 0.28 g

Vivek Krishna

85. Identify the incorrect match.

	Multiple	Prefix
(1)	10^{-15}	Femto
(2)	10^{-12}	Pico
(3)	10^{15}	Tera
(4)	10^{2}	Hecto

(1) (1)

(2) (2)

(3) (3)

(4) (4)

86. Consider the following statements.
a. Zeros preceding to first non-zero digit are not significant.
b. Zeros between two non-zero digits are not significant.
c. 0.200 g has three significant figures.
Choose the incorrect statement(s)

(1) a and c only

(2) a, b and c

(3) c only

(4) b only

87. Given below are two statements: one is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**.
Assertion (A): Equal number of moles of different gases always contain same number of atoms.
Reason (R): Under same conditions of temperature and pressure, equal volumes of different gases contain equal number of molecules.
In the light of above statements, choose the most appropriate answer from the options given below.

(1) Both (A) and (R) are true and (R) is the correct explanation of (A)

(2) Both (A) and (R) are true but (R) is not the correct explanation of (A)

(3) (A) is true but (R) is false

(4) (A) is false but (R) is true

88. The mass of zinc required to produce 2.24 L of hydrogen gas at STP on treatment with excess of dilute HCl is (Atomic mass of Zn = 65.4 u)

(1) 13.0 g

(2) 6.54 g

(3) 3.25 g

(4) 19.54 g

89. Suppose two elements X and Y combine to form two compounds X_2Y_3 and X_2Y_5. If 0.2 mole of X_2Y_3 weighs 22 g and 0.05 mole of X_2Y_5 weighs 7.1 g then atomic masses of X and Y respectively are

(1) 27 u and 16 u

(2) 32 u and 24 u

(3) 31 u and 16 u

(4) 31 u and 14 u

90. The number of atoms in 0.5 mole of H_2O is ($N_A = 6.0 \times 10^{23}\ mol^{-1}$)

(1) 6.0×10^{23}

(2) 4.5×10^{23}

(3) 9.0×10^{23}

(4) 1.2×10^{24}

Vivek Krishna

BOTANY

91. Match the following columns and choose the **correct** option.

Column I	Column II
a. Fluid-mosaic model	(i) Golgi apparatus
b. Calcium pectate	(ii) Plasma membrane
c. Divide by fission	(iii) Middle lamella
d. Formation of glycoproteins and glycolipids	(iv) Mitochondria

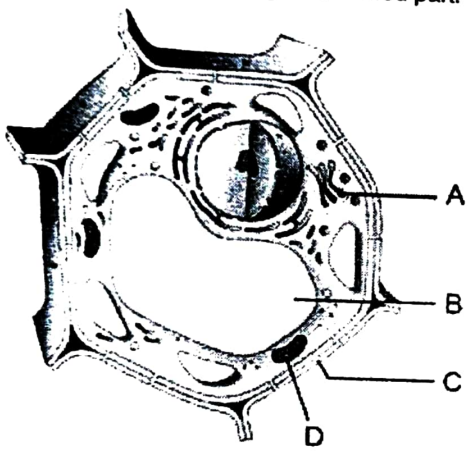
(1) a(i), b(iv), c(ii), d(iii)

(2) a(iii), b(i), c(ii), d(iv)

(3) a(ii), b(iii), c(iv), d(i)

(4) a(i), b(ii), c(iii), d(iv)

92. Consider the following diagram and select the option which is **not** true regarding the labelled part.



(1) A – Performs the function of packaging material

(2) B – Contains excretory products and other materials

(3) C – Made up of cellulose

(4) D – Contains xanthophylls

93. How many of the following statements is/are **correct**?
(a) The cell wall of a young plant cell is capable of growth.
(b) Secondary cell wall holds or glues the different neighbouring cells together.
(c) Middle lamella is formed on the inner side of the plant cell.
(d) The cell wall and middle lamella may be traversed by plasmodesmata which connect the cytoplasm of neighbouring cells.

(1) One

(2) Three

(3) Four

(4) Two

94. Consider the given statements stating them true **(T)** or false **(F)** and select the **correct** option.
A. Cytoplasm is the main arena of cellular activities.
B. Eukaryotic cells have two envelope system.
C. Cell wall maintains shape of the cells.
D. In *Amoeba*, contractile vacuole provides buoyancy.

(1) A-(F), B-(T), C-(F), D-(T)

(2) A-(F), B-(F), C-(F), D-(F)

(3) A-(T), B-(T), C-(T), D-(T)

(4) A-(T), B-(T), C-(T), D-(F)

95. Match the columns and select the **correct** option.

	Column I		Column II
i.	Aleuroplast	(a)	Rich in carotenoids
ii.	Chromoplast	(b)	Stores fats
iii.	Chloroplast	(c)	Synthesis of carbohydrates
iv.	Elaioplast	(d)	Stores proteins

	i	ii	iii	iv
(1)	(c)	(a)	(d)	(b)
(2)	(b)	(d)	(a)	(c)
(3)	(b)	(c)	(d)	(a)
(4)	(d)	(a)	(c)	(b)

(1) (1)

(2) (2)

(3) (3)

(4) (4)

96. There are some surface structures of the bacteria that do not play a role in motility. They are
a. Pili
b. Flagella
c. Fimbriae

(1) a & b

(2) Only b

(3) a & c

(4) Only c

97. Which of the following cell organelles is **not** the part of endomembrane system?

(1) Endoplasmic reticulum

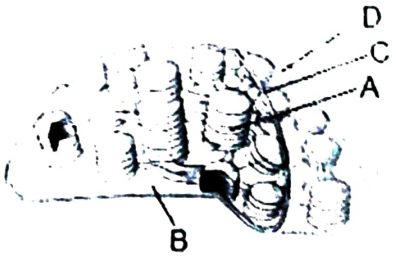
(2) Golgi complex

(3) Lysosomes

(4) Mitochondria

Vivek Krishna

98. The figure given below shows the structure of a chloroplast with its four parts labelled as A, B, C and D. Select the part **correctly** matched with its function.



(1) A - Site for protein synthesis

(2) B - Contains enzymes required for synthesis of carbohydrates

(3) C - Freely permeable membrane

(4) D - Site for light reaction

99. In some bacteria, there are small bristle-like fibres sprouting out of the cell are known to

(1) Be involved in the mating process

(2) Provide gummy and sticky character to the cell

(3) Help in attaching the bacteria to rocks in streams

(4) Provide motility

100. Nucleolus is the site of the synthesis of

(1) rRNA

(2) Proteins

(3) DNA

(4) mRNA

101. Which of the following shows cart wheel like structure in its transverse section?

(1) Filament of cilia

(2) Kinetochore

(3) Centriole

(4) Centromere

102. Which of the given structures of cyanobacteria has functional resemblance with the chloroplast?

(1) Lamellasome

(2) Plasma membrane

(3) Ribosome

(4) Chromatophore

103. Chromatin contains
(a) DNA
(b) Basic proteins
(c) Non-histone proteins
(d) RNA

(1) (a) and (b) only

(2) (a) and (c) only

(3) (a), (b) and (d) only

(4) All (a), (b), (c) and (d)

104. Polysomes found in prokaryotes are

(1) Ribosomes bound to their plasma membrane

(2) Several ribosomes attached to a single mRNA

(3) Several ribosomes attached to the nucleus

(4) Inclusion bodies, surrounded by a single layer

105. Which of the following are **not** the functions associated with mesosomes?
a. DNA replication
b. Cell membrane formation
c. Protein synthesis
d. Respiration
e. Distribution of DNA to daughter cells.

(1) a, b and d

(2) b and c

(3) a, d and e

(4) All except c

106. The membrane proteins are classified as integral or peripheral. The basis of this classification is

(1) Quasi-fluid nature

(2) Biochemical investigation

(3) Ease of extraction

(4) Requirement of energy for transport of material

107. *Mycoplasma* has/shows

(1) Rigid cell wall

(2) Mitochondria and plastids

(3) ds DNA as genetic material

(4) Motility with the help of flagellum

108. Cytoskeleton performes all of the following functions, **except**

(1) Mechanical support

(2) Lipid synthesis

(3) Motility

(4) Maintenance of cell shape

109. Identify the **incorrect** statement w.r.t. ribosomes.

(1) They are non-membrane bound organelles found in all living cells.

(2) They are sites of protein synthesis.

(3) They are composed of mRNA and protein

(4) They are associated with the plasma membrane of the prokaryotic cell

110. According to the cell theory

(1) All living cells have nucleus

(2) All cells arise from pre-existing cells

(3) Organisms are always composed of more than one cell

(4) Cell wall is a unique character of every cell

Vivek Krishna

111. Mark the following statements as true (T) or false (F) and select the **correct** option.
A. Acrocentric chromosome appears J-shaped during anaphase.
B. Centromere holds two chromatids together.
C. Outer membrane of nucleus is connected with SER only.

	A	B	C
(1)	T	F	F
(2)	F	T	T
(3)	T	T	F
(4)	F	F	T

(1) (1)
(2) (2)
(3) (3)
(4) (4)

112. In prokaryotes, the organelle that is associated with the plasma membrane of the cell
(1) Is about 15 nm by 20 nm in size and forms polysome
(2) Is the site of glycoproteins and glycolipid synthesis
(3) Confers certain unique phenotypic characters like antibiotic resistance
(4) Is identical to the non-membrane bound organelle found on the surface of ER of eukaryotes.

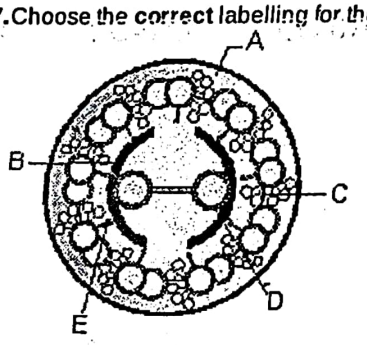
113. Loose and indistinct network of nucleoprotein fibres present in interphase nucleus is called
(1) Chromosome
(2) Chromatin
(3) Centromere
(4) Chromatid

114. The quasi-fluid nature of plasma membrane is due to
(1) Proteins
(2) Phospholipids
(3) Oligosaccharides
(4) Transmembrane proteins

115. How many of the following structures in a cell are **not** bounded by any membrane?
Lysosome, Vacuole, Ribosome, Centrosome, Cilium, Nucleolus
(1) Two
(2) Three
(3) Five
(4) Four

116. Read the following **Assertion (A)** and **Reason (R)** and select the **correct** option.
Assertion (A): Ion concentration is significantly higher in the vacuole than in the cytoplasm.
Reason (R): Tonoplast facilitates the transport of a number of ions and other materials against the concentration gradient into the vacuole.
(1) Both (A) and (R) are true and (R) is the correct explanation of (A)
(2) Both (A) and (R) are true but (R) is not the correct explanation of (A)
(3) Both (A) and (R) are false
(4) (A) is true but (R) is false

117. Choose the **correct** labelling for the given diagram.



(1) A – Central sheath
B – Intertriplet bridge
(2) B – Plasma membrane
D – Central microtubule
(3) E – Radial spoke
D – Incomplete microfilament
(4) B – Central sheath
C – Interdoublet bridge

118. Fluid mosaic model of cell membrane was proposed by
(1) Robert Brown
(2) Flemming
(3) Rudolf Virchow
(4) Singer and Nicolson

119. Disc-shaped structure present on the sides of the centromere is called
(1) Kinetochore
(2) Telomere
(3) Centrosome
(4) Nucleoplasm

120. The main constituent of the fungal cell wall is
(1) Cellulose
(2) Peptidoglycan
(3) Chitin
(4) Mannans

Vivek Krishna

121. Who first explained "*Omnis cellula-e cellula*"?

(1) Schleiden

(2) Schwann

(3) Rudolf Virchow

(4) Robert Brown

122. The small fragment of chromosome that appears due to non-staining secondary constriction is called

(1) Centromere

(2) Satellite

(3) Kinetochore

(4) Telomere

123. The membranous extensions found in cytoplasm of cyanobacteria and purple bacteria that contain pigments are

(1) Mesosomes

(2) Glycocalyx

(3) Polysomes

(4) Chromatophores

124. The enzymes required for the synthesis of carbohydrates are located in which part of chloroplasts?

(1) Thylakoid

(2) Grana

(3) Stroma

(4) Stroma lamella

125. DNA is not found in

(1) Nucleus

(2) Mitochondria

(3) Ribosome

(4) Chloroplast

126. Which of the following components determines the shape of the cell and provide strong structural support to prevent the bacterium from bursting or collapsing?

(1) Slime layer

(2) Plasma membrane

(3) Capsule

(4) Cell wall

127. Which among the following layers of bacterial envelope allows bacterium to hide from host's immune system?

(1) Cell wall

(2) Slime layer

(3) Capsule

(4) Plasma membrane

128. Which of the following are not seen in a prokaryotic cell?

(1) Ribosomes

(2) Lysosomes

(3) Mesosomes

(4) Plasmids

129. In the fluid mosaic model of the cell membrane

(1) Lipids are arranged in a single layer

(2) Proteins are sandwiched between two layers of lipids

(3) Proteins are represented as icebergs in the sea of lipids

(4) Proteins are arranged in a continuous sheet on the membrane surface

130. Thylakoids stack to form

(1) Stroma lamellae

(2) Grana

(3) Matrix

(4) Cristae

131. Which of the given statements is/are **true** for endoplasmic reticulum?
(a) Cisternae are usually attached with 50S subunit of 80S ribosomes
(b) Ribosomes present on RER are involved in protein synthesis
(c) Synthesis as well as processing and packaging of lipids is performed by SER.

(1) (a) only

(2) (a) and (b)

(3) (b) only

(4) (c) and (c)

132. Nucleus as a cell [illegible] was first described by

(1) Theodor Schw[illegible]

(2) Robert Brown

(3) Robert Hooke

(4) Matthias Schleiden

133. Neutral solute molecules move across the membrane by

(1) Na^+/K^+ pump

(2) Active transport

(3) Osmosis

(4) Simple diffusion

134. Small hair-like structures, which work like oars, causing the movement of either the cell or surrounding fluid is

(1) Fimbriae

(2) Flagella

(3) Cilia

(4) Pili

135. Mitochondria are the site of

(1) Aerobic respiration

(2) Anaerobic respiration

(3) Reduction of CO_2

(4) Synthesis of carbohydrate

Vivek Krishna

ZOOLOGY

136. In epithelial tissue

(1) Cells are compactly packed with large amounts of intercellular matrix

(2) A free surface is present which faces either a body fluid or the outside environment

(3) The tissue provides a protective covering or lining for all parts of the body

(4) The cells are always loosely packed with little intercellular matrix

137. Identify the number of compounds from the box given below which form a part of acid-soluble fraction.

Monosaccharides, Lipids, Amino acids, Polysaccharides

Choose the correct option.

(1) One

(2) Two

(3) Three

(4) Four

138. A type of animal tissue in which cells and fibres are loosely arranged in a semi-fluid ground substances and is usually present beneath the skin is

(1) Dense regular connective tissue

(2) Loose connective tissue

(3) Specialized connective tissue

(4) Dense irregular connective tissue

139. Read the following given statements and choose the **correct** option.
Statement A : All the carbon compounds that we get from living tissues can be called biomolecules.
Statement B : Living organisms do not possess inorganic compounds.

(1) Both statements A and B are correct

(2) Both statements A and B are incorrect

(3) Only statement A is correct

(4) Only statement B is correct

140. Select the option that correctly represents a set of homopolymers.

(1) Polypeptides, glycogen and starch

(2) Cellulose, insulin and polypeptides

(3) Insulin, chitin and peptide

(4) Starch, cellulose and inulin

141. 'This tissue is the most abundant and widely distributed tissue in the body of complex animals'.
Which tissue is being referred to?

(1) Connective tissue

(2) Epithelial tissue

(3) Nervous tissue

(4) Muscular tissue

142. Why cellulose cannot hold iodine molecule to give blue colour as happened in starch?

(1) It contains abundant helices

(2) It contains less helices

(3) It does not contain complex helices

(4) It does not contain beta-pleated sheet

143. **Assertion (A):** The intercellular material of bone is hard and non-pliable.
Reason (R): Due to presence of calcium salts and collagen fibres in matrix, Bone is hard and non-pliable.
In the light of above statements, select the **correct** option.

(1) Both (A) and (R) are false

(2) Both (A) and (R) are true and (R) is the correct explanation of (A)

(3) Both (A) and (R) are true but (R) is not the correct explanation of (A)

(4) (A) is true but (R) is false

144. Facilitation of rapid transfer of ions among cells is the function of

(1) Tight junctions

(2) Gap junctions

(3) Areolar tissue

(4) Adhering junctions

145. Secondary metabolites like carotenoids and anthocyanins are

(1) Lectins

(2) Essential oils

(3) Alkaloids

(4) Pigments

146. Common feature of starch and glycogen is that both

(1) Are structural polysaccharides

(2) Are storage polysaccharides

(3) Are heteropolymers of glucose and fructose

(4) Give red colour with I_2 solution

Vivek Krishna

147. Which type of epithelium has limited role in secretion and absorption?

(1) Simple epithelium

(2) Simple cuboidal epithelium

(3) Compound epithelium

(4) Simple columnar epithelium

148. The site of production of blood cells is associated with which type of connective tissue?

(1) Areolar connective tissue

(2) Dense regular connective tissue

(3) Dense irregular connective tissue

(4) Specialised connective tissue

149. Read the following statements A & B and choose the correct answer
Statement A: All the elements present in sample of earth's crust are also present in a sample of living tissues
Statement B: Relative abundance of carbon & hydrogen with respect to other elements is higher in any living organism than in earth's crust

(1) Both statements A & B are correct

(2) Both statements A & B are incorrect

(3) Only statement A is correct

(4) Only statement B is correct

150. Presence of intercalated discs are characteristic feature of

(1) All striated muscles

(2) Smooth muscles

(3) Biceps

(4) Cardiac muscles

151. _____ is a structural homopolysaccharide.
Select the **correct** option to fill in the blank.

(1) Collagen

(2) Starch

(3) Glycogen

(4) Chitin

152. Which type of simple epithelial tissue is found in the lining of intestine facing the lumen?

(1) Squamous epithelium

(2) Cuboidal epithelium

(3) Columnar epithelium

(4) Ciliated epithelium

153. Which secondary metabolites is **not** a polymeric substance?

(1) Rubber

(2) Monoterpenes

(3) Gums

(4) Cellulose

154. **Odd** one w.r.t derived monosaccharide is

(1) Glucosamine

(2) Galactosamine

(3) Deoxyribose

(4) Fructose

155. In our body, the neuroglial cell

(1) Make up less than 50% of the volume of neural tissue

(2) Are excitable cells

(3) Can trigger events which may cause stimulation or inhibition of adjacent neural cells

(4) Provide protection and support to the basic units of nervous system

156. From the elemental point of view, which of the following elements constitutes about 65% weight of human body?

(1) Carbon

(2) Hydrogen

(3) Oxygen

(4) Sodium

157. Choose the **incorrect** option regarding to areolar tissue.

(1) Present beneath the skin

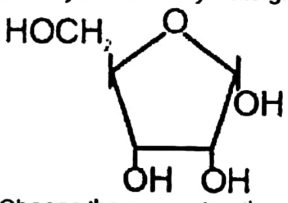
(2) Contains fibres that shorten in response to stimulation

(3) Contains collagen fibres

(4) Has macrophages scattered in its semi-fluid ground substance

Vivek Krishna

158. Identify the carbohydrate given below.



Choose the **correct** option

(1) Fructose

(2) Ribose

(3) Deoxyribose

(4) Glucose

159. Cell membranes are broken into pieces to form vesicles which get separated along with

(1) Acid-soluble pool

(2) Acid-insoluble pool

(3) Ash

(4) Filtrate

160. A group of A cells along with B substances perform a specific function such an organisations is called tissue.
Choose the option that correctly fills the blanks A and B

(1) Dissimilar, Intracellular

(2) Similar, Intracellular

(3) Dissimilar, Intercellular

(4) Similar, Intercellular

161. Complete the analogy w.r.t. secondary metabolites.
Morphine : Alkaloid : : Ricin : _____.

(1) Lectin

(2) Pigment

(3) Essential oil

(4) Toxin

162. Which one is **not** a specialized connective tissue?

(1) Ligament

(2) Lymph

(3) Blood

(4) Cartilage

163. Select the **incorrect** statement.

(1) Blood is a fluid connective tissue

(2) Most of the cartilages in vertebrate embryos are replaced by bones in adults

(3) The smooth muscle fibres taper at both ends and show striations

(4) Tight junctions help to stop substances from leaking across a tissue

164. Read the following statements and select the **correct** option.
Statement A: The acid-soluble pool represents roughly the cytoplasmic composition.
Statement B: The macromolecules from cytoplasm and organelles are present in the acid-insoluble fraction.

(1) Both statements A and B are correct

(2) Both statements A and B are incorrect

(3) Only statement A is correct

(4) Only statement B is correct

165. Match column I **correctly** with column II and select the correct option.

	Column I		Column II
a.	Polymeric substances	(i)	Lemon grass oil
b.	Essential oils	(ii)	Gums
c.	Pigments	(iii)	Carotenoids

(1) (a-i), (b-ii), (c-iii)

(2) (a-ii), (b-iii), (c-i)

(3) (a-ii), (b-i), (c-iii)

(4) (a-i), (b-iii), (c-ii)

166. Salivary glands are

(1) Unicellular glands

(2) Multicellular, endocrine glands

(3) Unicellular, exocrine glands

(4) Multicellular, exocrine glands

167. In a polysaccharide chain, the right end is called the A end and the left end is called the B end. Which option correctly fills the blanks A and B respectively?

(1) Reducing, reducing

(2) Non-reducing, reducing

(3) Reducing, non-reducing

(4) Oxidising, reducing

168. The percentage weight of carbon in human body under normal conditions is

(1) 3.3

(2) 18.5

(3) 1.5

(4) 65.0

169. In humans, the type of simple epithelium lining the blood vessels is also present in

(1) Lining of stomach

(2) Fallopian tubes

(3) Alveoli of lungs

(4) Lining of pharynx

170. **Assertion :** Certain secondary metabolites are useful to "human welfare".
Reason : Coloured pigments, rubber, scents and antibiotics useful to humans are extracted from plants, fungal and microbial cells.
In the light of above statements, choose the **correct** option.

(1) Both Assertion & Reason are true and the reason is the correct explanation of the assertion

(2) Both Assertion & Reason are true but the reason is not the correct explanation of the assertion

(3) Assertion is true statement but Reason is false

(4) Both Assertion and Reason are false statements

171. Ligaments connect

(1) Muscle to bone

(2) Muscle to muscle

(3) Bone to bone

(4) Muscle to skin

Vivek Krishna

172. Which of the following is a **correct** representation of various cellular components in decreasing order of their percentage of the total cellular mass?

(1) Water > Proteins > Lipids > Ions > Nucleic acids

(2) Water > Nucleic acids > Ions > Proteins > Lipids

(3) Water > Proteins > Nucleic acids > Carbohydrates > Lipids > Ions

(4) Proteins > Water > Lipids > Nucleic acid > Carbohydrate

173. Select the **incorrect** option w.r.t. secretions of exocrine glands.

(1) Digestive enzymes

(2) Mucus

(3) Hormones

(4) Saliva

174. Select the **odd** one w.r.t. primary metabolites

(1) Amino acids

(2) Sugars

(3) Drugs

(4) Chlorophylls

175. Read the following given statements w.r.t. starch.
Statement A : Starch forms helical primary structures.
Statement B : Starch holds iodine molecules and give blue color.
Choose the **correct** option.

(1) Both statements A and B are incorrect

(2) Both statements A and B are correct

(3) Statement A is incorrect, statement B is correct

(4) Statement A is correct, statement B is incorrect

176. Read the following statements and select the option representing function(s) of adhering junctions.
(i) They provide both structural and functional links between individual cells.
(ii) They prevent leaking of substance across a tissue.
(iii) They perform cementing to keep neighbouring cells together.

(1) (i) and (ii) only

(2) (ii) and (iii) only

(3) (i) only

(4) (i) and (iii) only

177. For analysis of organic compounds, living tissue is grinded in

(1) Ash

(2) Cl_3CCOOH

(3) CCl_4

(4) CH_3COOH

178. How many components given in the box below are common to areolar tissue as well as adipose tissue?
Fibroblasts, Macrophages, Mast cells, Adipocytes, Collagen fibres

(1) Five

(2) Three

(3) Four

(4) Zero

179. Epithelial tissue facilitates all of the following, **except**

(1) Diffusion of gases

(2) Protection against chemical stress

(3) Secretion and absorption

(4) Locomotion of animals

180. When a tissue is fully burnt, 'Ash' is obtained which contains all of the following substances **except**

(1) Calcium

(2) Magnesium

(3) Carbon

(4) Potassium

Vivek Krishna